Remarks

Applicant has amended the independent claims to overcome the Examiner's objection to the use of "and if so" language in the claims.

On prior art, the Examiner has rejected all claims as anticipated by Agrawal '029. The Examiner specifically cites to col. 15, lines 26-30 and to Fig. 6 items 601,602 and 603.

Applicant traverses this rejection, and will begin discussion by a review of the claimed subject matter, and then discuss Agarawal.

The present application, as explained in the background and specification, is directed to evaluating join predicates in a query to determine selectivity of a join between a first and second relation. An example of the issue is provided in the Background, pages 2-3, which describes a query seeking total sales figures for a product in the New England region. This query involves the join of a (relative small) SKU table, (relatively large) Sales table, and (relatively small) Stores table. Furthermore, since the search is limited to New England, the Sales table join will be very selective -- potentially involving only one record for a single New England store. The background of the present application goes on to explain methods in which such a query might be handled inefficiently.

An objective the present invention is set forth on page 4, specifically, to provide a "method for identifying when a query may be more efficiently implemented with nonconventional join techniques in more diverse circumstances than has previously been the case." The application proceeds to describe methods for evaluating a join of two relations found in a query, to determine whether that join will be selective, so that the join may be performed in an efficient manner "by the prior application of a look up predicate based upon the second relation in the join." The use of lookup predicates is described in the Background, page 3 -- a lookup predicate is an intermediate result of all tuples matching a selection criterion on an outer table of a join, and when a join is performed with a lookup predicate, the join involves comparing all tuples in the selection criterion to the tuples in the inner table at the same time, streamlining processing as compared to conventional methods.

The present claims, therefore, are directed to the evaluation of a join to determine whether it will be selective on one of the relations, and if so, performing the join by the application of a "look ahead predicate," as described.

The Examiner has rejected all claims as anticipated by Agarawal. However, Agarawal nowhere deals with the issues discussed, specifically, Agarawal does not relate to evaluating a join to determine whether it is selective of a relation, and in response "performing a query by the prior application of a look-ahead predicate based upon the second relation in the join," as claimed herein.

In contrast to these issues and concept, Agarawal is directed to a type of index known as a "materialized view". Agrawal explains that a "materialized view" "is some view of the data, such as the results of a query, which have been materialized. A materialized view may not be directly tied to a query. A materialized view has some characteristics that a traditional index does not have. Materialized views may be defined over multiple tables, and can have selections and group-by over multiple columns. It can have selection and grouping of columns." Agarawal goes on to explain that query performance can be improved using "materialized views", specifically by shortening the query by using the "materialized view" to form intermediate query results, instead of generating those intermediate results from scratch from the relations of the database.

The material cited by the Examiner in Agarawal is directed specifically to the determination of which materialized views should be formed and retained in memory, i.e., identifying those materialized views that will be beneficial and not consume excessive memory. The Examiner's references to Fig.6 and to the text in Fig. 15 all relate to this main intention of Agarawal to find efficient and useful "materialized views".

While Agarawal is thus related generally to database processing, it bears no relation to the claimed invention. First, the formation of "materialized views" is not a query processing step, but a precursor to performing a query. Thus, the presently claimed invention which relates to "performing a query" cannot be anticipated by the creation of "materialized views". Furthermore, the creation of "materialized views" does not involve the claim steps, most particularly the claim step of determining whether a join will be reductive of a relation so that the query can be performed "by the prior application of a look-ahead predicate". There is simply no discussion in the Agarawal text cited by the Examiner of the use of a look-ahead predicate or the determination of when one should be used. (The Examiner appears to theorize that the use of a query optimizer to estimate the number of rows in a join is the same as using a look-ahead predicate. The foregoing explanation should dispel this misunderstanding.)

Applicant thus submits that all claims, as now amended to overcome the Examiner's formal objections, are allowable over the cited prior art, and requests issuance of Notice of Allowability.

If any petition for extension of time is necessary to accompany this communication, please consider this paper a petition for such an extension of time, and apply the appropriate extension of time fee to Deposit Account 23-3000. If any other charges or credits are necessary to complete this communication, please apply them to Deposit Account 23-3000.

Respectfully submitted,

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